



# BD235 BD236 BD237 BD238

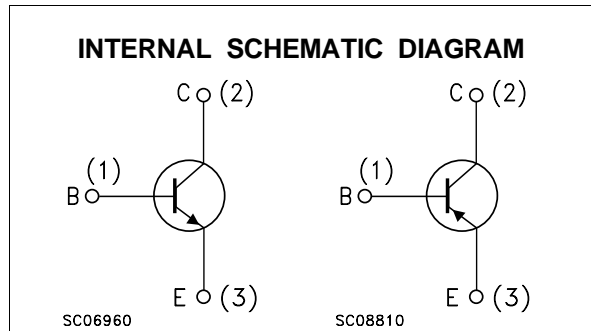
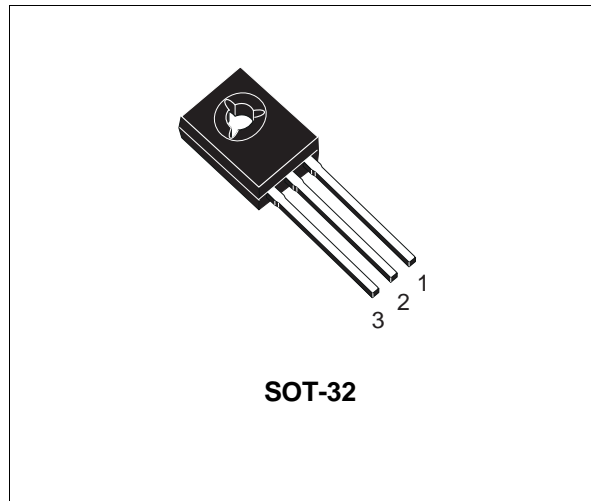
## COMPLEMENTARY SILICON POWER TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES

### DESCRIPTION

The BD235 and BD237 are silicon epitaxial-base NPN power transistors in Jedec SOT-32 plastic package intended for use in medium power linear and switching applications.

The complementary PNP types are BD236 and BD238 respectively.



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                      | Value |            | Unit |       |
|-----------|--|-------|------------|------|-------|
|           |  | NPN   | BD235      |      | BD237 |
|           |  | PNP   | BD236      |      | BD238 |
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )           |       | 60         | 100  | V     |
| $V_{CER}$ | Collector-Base Voltage ( $R_{BE} = 1K\Omega$ ) |       | 60         | 100  | V     |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )        |       | 60         | 80   | V     |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )             |       | 5          |      | V     |
| $I_C$     | Collector Current                              |       | 2          |      | A     |
| $I_{CM}$  | Collector Peak Current ( $t_p < 5$ ms)         |       | 6          |      | A     |
| $P_{tot}$ | Total Dissipation at $T_c = 25$ °C             |       | 25         |      | W     |
| $T_{stg}$ | Storage Temperature                            |       | -65 to 150 |      | °C    |
| $T_j$     | Max. Operating Junction Temperature            |       | 150        |      | °C    |

For PNP types voltage and current values are negative.

# BD235 BD236 BD237 BD238

## THERMAL DATA

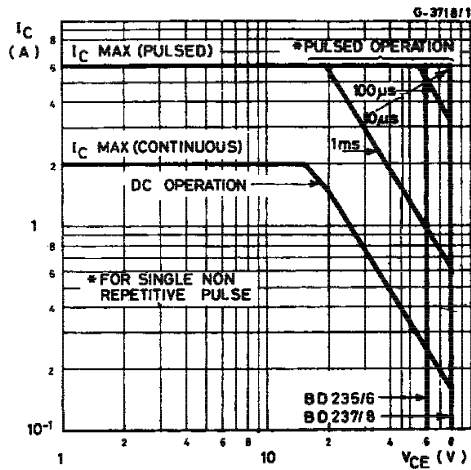
|                       |                                  |     |   |      |
|-----------------------|----------------------------------|-----|---|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case | Max | 5 | °C/W |
|-----------------------|----------------------------------|-----|---|------|

## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

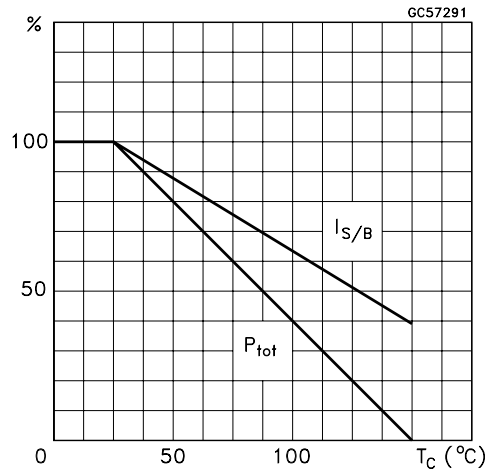
| Symbol                              | Parameter   | Test Conditions  | Min.     | Typ. | Max.     | Unit     |
|-------------------------------------|---|--|----------|------|----------|----------|
| I <sub>CBO</sub>                    | Collector Cut-off Current (I <sub>E</sub> = 0)            | V <sub>CE</sub> = rated V <sub>CEO</sub><br>V <sub>CE</sub> = rated V <sub>CEO</sub> T <sub>C</sub> = 150 °C |          |      | 0.1<br>2 | mA<br>mA |
| I <sub>EBO</sub>                    | Emitter Cut-off Current (I <sub>C</sub> = 0)              | V <sub>EB</sub> = 5 V  |          |      | 1        | mA       |
| V <sub>CEO(sus)*</sub>              | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 100 mA<br>for <b>BD235 / BD236</b><br>for <b>BD237 / BD238</b>                              | 60<br>80 |      |          | V<br>V   |
| V <sub>CE(sat)*</sub>               | Collector-Emitter Saturation Voltage                      | I <sub>C</sub> = 1 A I <sub>B</sub> = 0.1 A  |          |      | 0.6      | V        |
| V <sub>BE*</sub>                    | Base-Emitter Voltage                                      | I <sub>C</sub> = 1 A V <sub>CE</sub> = 2 V   |          |      | 1.3      | V        |
| h <sub>FE*</sub>                    | DC Current Gain   | I <sub>C</sub> = 150 mA V <sub>CE</sub> = 2 V<br>I <sub>C</sub> = 1 A V <sub>CE</sub> = 2 V                  | 40<br>25 |      |          |          |
| f <sub>T</sub>                      | Transition frequency                                      | I <sub>C</sub> = 250 mA V <sub>CE</sub> = 10 V   | 3        |      |          | MHz      |
| h <sub>FE1</sub> /h <sub>FE2*</sub> | Matched Pairs   | I <sub>C</sub> = 150 mA V <sub>CE</sub> = 2 V  |          | 1.6  |          |          |

\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

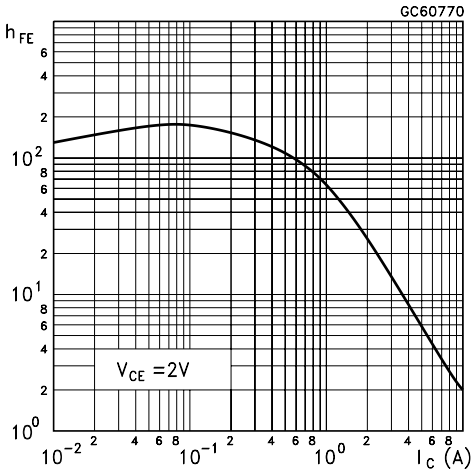
## Safe Operating Area



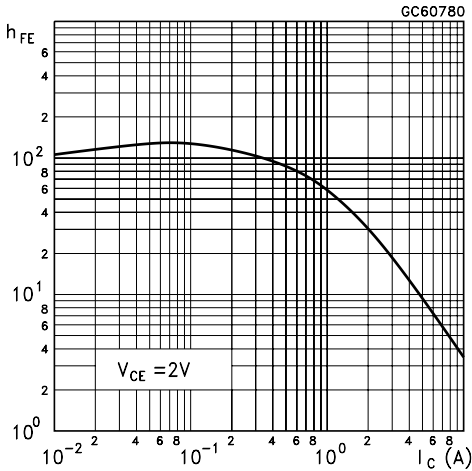
## Derating Curve



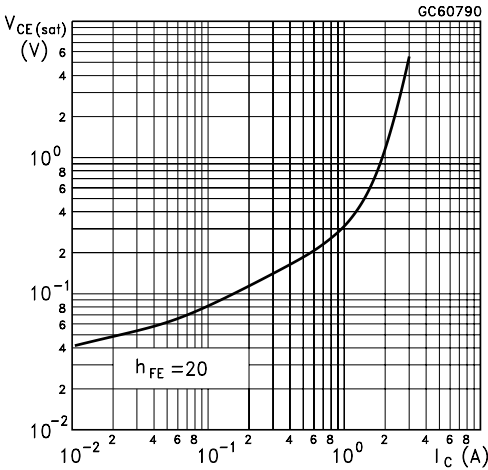
DC Current Gain (NPN type)



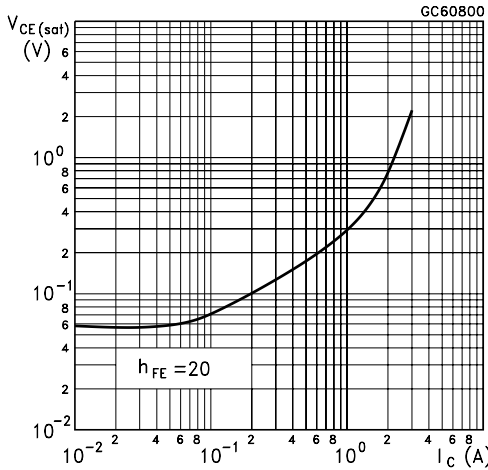
DC Current Gain (PNP type)



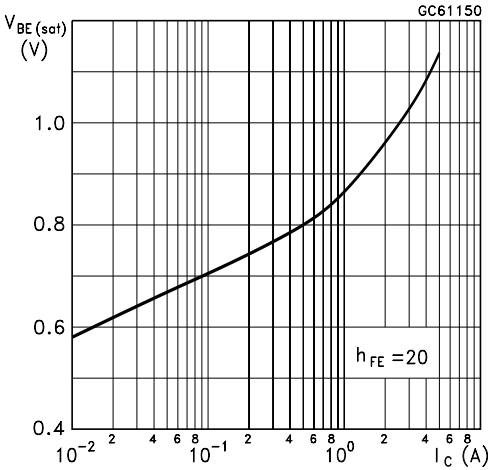
Collector-Emitter Saturation Voltage (NPN type)



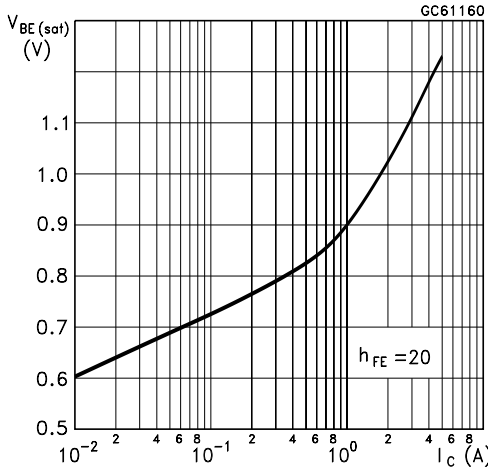
Collector-Emitter Saturation Voltage (PNP type)



Base-Emitter Saturation Voltage (NPN type)

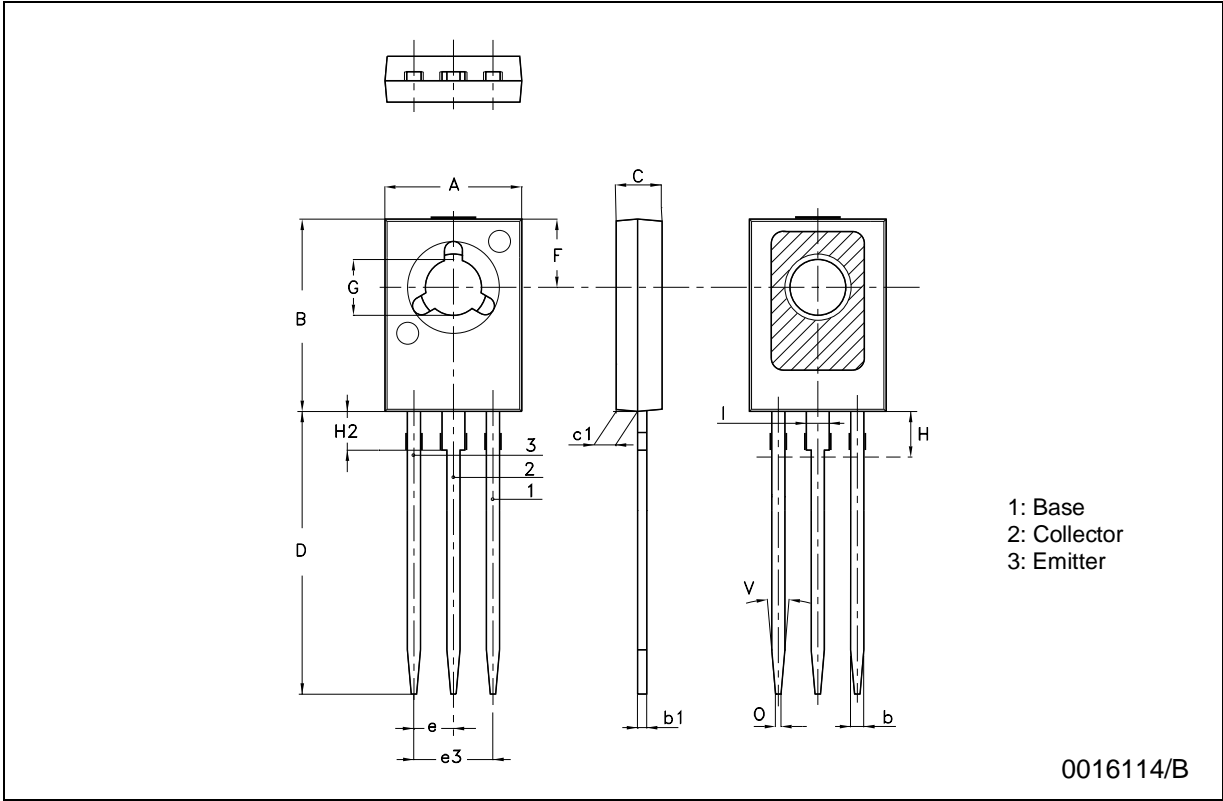


Collector-Base Capacitance (PNP type)



**SOT-32 (TO-126) MECHANICAL DATA**

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 7.4  |      | 7.8  | 0.291 |       | 0.307 |
| B    | 10.5 |      | 10.8 | 0.413 |       | 0.425 |
| b    | 0.7  |      | 0.9  | 0.028 |       | 0.035 |
| b1   | 0.40 |      | 0.65 | 0.015 |       | 0.025 |
| C    | 2.4  |      | 2.7  | 0.094 |       | 0.106 |
| c1   | 1.0  |      | 1.3  | 0.039 |       | 0.051 |
| D    | 15.4 |      | 16.0 | 0.606 |       | 0.630 |
| e    |      | 2.2  |      |       | 0.087 |       |
| e3   |      | 4.4  |      |       | 0.173 |       |
| F    |      | 3.8  |      |       | 0.150 |       |
| G    | 3    |      | 3.2  | 0.118 |       | 0.126 |
| H    |      |      | 2.54 |       |       | 0.100 |
| H2   |      | 2.15 |      |       | 0.084 |       |
| I    |      | 1.27 |      |       | 0.05  |       |
| O    |      | 0.3  |      |       | 0.011 |       |
| V    |      | 10°  |      |       | 10°   |       |



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